

## A B S T R A C T

There is provided a method and apparatus for processing an organosiloxane film, which allow an inter-level insulating film with a low dielectric constant to be formed at a low heat process temperature. A semiconductor (10) with a coating film formed thereon is loaded into a reaction tube (2) of a heat-processing apparatus (1). Then, the interior of the reaction tube (2) is stabilized at a predetermined pressure, and hydrogen is supplied into an inner tube (3) through an acidic gas feed line (13), to heat the coating film under an acidic atmosphere. Then, the interior of the reaction tube (2) is heated up to a predetermined temperature, while heating the coating film under an acidic atmosphere. Then, gas inside the reaction tube (2) is exhausted, and ammonia is supplied into the inner tube (3) through an alkaline gas feed line (14), to heat the coating film under an alkaline atmosphere.